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<b>APPELLANTS' BRIEF</b>  Address to: Mail Stop Appeal Brief-Patents Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450	Application Number	10/061,800
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	First Named Inventor	Svetlana Shchegrova
	Examiner	Mark Lance Shibuya
	Group Art	1639
	Title: <i>Error Correction In Array Fabrication</i>	

Sir:

This Brief is filed in support of Appellants' appeal from the Examiner's Rejection dated August 6, 2007. No claims have been allowed. Claims 1-33 and 49-53 are pending all of which are appealed. A Notice of Appeal was filed on December 13, 2007. As such, this Appeal Brief is timely filed.

The Board of Appeals and Interferences has jurisdiction over this appeal pursuant to 35 U.S.C. §134.

The Commissioner is hereby authorized to charge deposit account number 50-1078, order no. 10010464-1 to cover the fee required under 37 C.F.R. §1.17(c) for filing Appellants' brief. In the unlikely event that the fee transmittal or other papers are separated from this document and/or other fees or relief are required, Appellants petition for such relief, including extensions of time, and authorize the Commissioner to charge any fees under 37 C.F.R. §§ 1.16, 1.17 and 1.21 which may be required by this paper, or to credit any overpayment, to deposit account number 50-1078, order no. 10010464-1.

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**REAL PARTY IN INTEREST**

The inventors named on this patent application assigned their entire rights to the invention to Agilent Technologies, Inc.

**RELATED APPEALS AND INTERFERENCES**

There are currently no other appeals or interferences known to Appellants, the undersigned Appellants' representative, or the assignee to whom the inventors assigned their rights in the instant case, which would directly affect or be directly affected by, or have a bearing on the Board's decision in the instant appeal.

**STATUS OF CLAIMS**

The present application was filed on January 30, 2002 with claims 1-48. During the course of prosecution, claims 34-48 are canceled and claims 49-53 are added. Accordingly, claims 1-33 and 49-53 are pending and stand rejected in the present application, all of which are appealed herein.

**STATUS OF AMENDMENTS**

No amendments to the claims were filed subsequent to issuance of the Final Rejection.

**SUMMARY OF CLAIMED SUBJECT MATTER**

The claimed invention is drawn to methods for fabricating a chemical array that provide for error correction during the fabrication process.

Below is a description of each independent claim appealed herein and where support for each can be found in the specification.

Independent claim 1 claims a method of fabricating a chemical array using a head system with multiple groups of drop dispensers, a transport system to move the head system with respect to a substrate, and a processor to dispense droplets from dispensers during operation of the transport system in a pattern along a selected path for each group (see specification at page 3, lines 21-25). The method comprises a) loading the dispensers with fluid such that each dispenser group has at least one set of redundant dispensers loaded with a same fluid (see specification at page 3, lines 25-

27), b) dispensing drops from the dispensers to identify an error in one or more dispensers (see specification at page 3, line 27), c) moving a first dispenser of each set in each group along the selected path for that group while dispensing drops from non-error first dispensers of the sets in at least part of the pattern along the selected path for each group (see specification at page 4, lines 4-6), d) moving a second dispenser of the sets in each group along the selected path for that group while dispensing drops from a non-error second dispenser of a set having an identified error first dispenser, in at least part of the pattern for the selected path of the first group, in which the non-error second dispenser dispense drops only where the identified error first dispenser did not dispense drops (see specification at page 3, line 15-page 4, line 27 and Fig. 4, 5, and 8), and e) repeating steps (a) through (d) at least once (see specification at page 4, lines 6-7).

Independent claim 6 claims a method of fabricating a chemical array using a head system with multiple groups of dispensers, the members of each group being arranged in multiple series extending in a first direction and multiple sets; a transport system to move the head system with respect to a substrate with different series following respective paths, series from different groups which can simultaneously move along the selected paths for their groups forming a dispenser frame; a processor to dispense drops from dispensers during operation of the transport system, in a pattern along a selected path for each group (see specification at page 4, lines 15-22). The method comprises a) loading the dispensers with fluid such that dispensers within each set of the groups are loaded with a same fluid (see specification at page 4, lines 22-23), b) dispensing drops from the dispensers to identify an error in one or more dispensers (see specification at page 4, line 24), c) moving a first dispenser frame along the selected paths for the groups while dispensing drops from non-error dispensers of the first frame in at least part of the patterns along the selected paths for the groups (see specification at page 4, lines 24-27), d) when an error dispenser is detected in the first frame, moving a further frame along the selected paths for the groups while dispensing drops from a non-error dispenser of the further frame located in the same set as the error dispenser, in at least part of the patterns along the selected paths for the groups (see specification at page 4, lines 27-30), and e) repeating (a) through (d) at least once (see specification at page 4, lines 30-31).

Independent claim 25 claims a method of fabricating a chemical array using a

head system with multiple groups of dispensers, the members of each group being arranged in multiple series extending in a first direction and multiple sets extending in a second direction sideways to the first direction; a transport system to move the head system with respect to a substrate with different series following respective paths, series from different groups which can simultaneously move along the selected paths for their groups forming a dispenser frame; a processor to dispense drops from dispensers during operation of the transport system, in a pattern along a selected path for each group (see specification at page 4, lines 15-22; and page 12, lines 14-16). The method comprises a) loading the dispensers with fluid such that dispensers within each set of the groups are loaded with a same fluid (see specification at page 4, lines 22-23), b) dispensing drops from the dispensers to identify an error in one or more dispensers (see specification at page 4, line 4), c) moving a first frame along the selected paths for the groups while dispensing drops from non-error dispensers of the first frame in at least part of the patterns along the selected paths for the groups (see specification at page 4, lines 24-27), and d) when an error dispenser is detected in the first frame, then multiple selected frames are moved along the selected paths for the groups while dispensing drops from non-error dispensers of each of the frames in at least part of the patterns along the selected paths for the groups, wherein each of the frames so moved is selected as the frame among previously non-selected frames which has the highest number of non-error dispensers in sets not containing a non-error dispenser in a previously selected frame (see specification at page 4, line 31-page 5, line 6).

Independent claim 52 claims a method of fabricating a chemical array using a head system with multiple groups of drop dispensers, a transport system to move the head system with respect to a substrate, and a processor to dispense droplets from dispensers during operation of the transport system in a pattern along a selected path for each group (see specification at page 3, lines 21-25). The method comprises a) loading the dispensers with fluid such that each dispenser group has at least one set of redundant dispensers loaded with a same fluid (see specification at page 3, lines 25-27), b) dispensing drops from the dispensers to identify an error in one or more dispensers (see specification at page 3, line 27), c) moving a first dispenser of each set in each group along the selected path for that group while dispensing drops from non-error first dispensers of the sets in at least part of the pattern along the selected path for

each group (see specification at page 4, lines 4-6), d) moving a second dispenser of the sets in each group along the selected path for that group while dispensing drops from a non-error second dispenser of a set having an identified error first dispenser, in at least part of the pattern for the selected path of the first group, in which the first and the second dispensers of the same set are not moved along the selected path simultaneously, and the non-error second dispenser dispense drops only where the identified error first dispenser did not dispense drops (see specification at page 3, line 15-page 4, line 27 and Fig. 4, 5, and 8), and e) repeating steps (a) through (d) at least once (see specification at page 4, lines 6-7).

**GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

- I. Claims 1-33 and 49-53 stand rejected under 35 U.S.C. §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which Appellants regard as the invention.
- II. Claims 1-33 and 49-53 stand rejected under 35 U.S.C. §112, first paragraph as failing to comply with the written description requirement.
- III. Claims 1-33 and 52 stand rejected under 35 U.S.C. §102(b) as being unpatentable over Kumar et al. (US 6,283,572).
- IV. Claims 1-33 and 49-53 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kumar et al. (US 6,283,572) in view of MacBeath et al. (*Science* 289:1760-1763)

**ARGUMENT**

I. Claims 1-33 and 49-53 are not indefinite under 35 U.S.C. §112, second paragraph.

Claims 1-33 and 49-53 are rejected under 35 U.S.C. § 112, second paragraph as being allegedly indefinite for failing to particularly point out and distinctly claim the subject matter which Appellants regard as the invention. The Appellants respectfully traverse this rejection. The Appellants will argue for the rejected claims in a single group.

In making this rejection, the Examiner asserts that the phrase “wherein the non-error second dispenser dispense drop only where the identified error first dispenser did not dispense drops in the pattern for the selected path” as recited in all the rejected independent claims encompasses multiple meanings. As will be discussed in greater detail below, the Appellants contend that one could not reasonably interpret this phrase in the context of the rejected claims to encompass the Examiner’s multiple interpretations.

The Federal Circuit’s *en banc* decision in *Phillips v. AWH Corp.* 415 F.3d 1303, 75 USPQ2d 1321 (Fed. Cir. 2005) provides detailed guidelines on claim interpretation. According to *Phillips*, claim terms must be given a reasonable meaning that is consistent with the meaning given by one of skill in the art. Moreover, in order to interpret claims as reasonably as a person of ordinary skill in the art, one must not only read the claim term in the context of the claim but must also take into account the entire patent, including the specification, extrinsic evidence concerning relevant scientific principles, and the state of the art.

This guidance is consistent with the case law<sup>1</sup>, which states that:

“claims must be given their plain meaning unless \*\*>the plain meaning is inconsistent with< the specification. *In re Zletz*, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322; *Chef America, Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1372, 69 USPQ2d 1857 (Fed. Cir. 2004) “[The] broadest reasonable interpretation of the claims must also be consistent with the interpretation that those skilled in the art would reach. *In re Cortright*, 165 F.3d 1353, 1359, 49 USPQ2d 1464, 1468 (Fed. Cir. 1999)” *Hyatt*, 211 F.3d at 1372

In light of the principle that a claim limitation must be given a reasonable meaning in the context of the claim, the Appellants disagree with the Examiner’s interpretation of the claim limitation at issue.

The Examiner asserts that the phrase “wherein the non-error second dispenser dispense drop only where the identified error first dispenser did not dispense drops in the pattern for the selected path” is indefinite because it can be

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<sup>1</sup>E.g., *Multiform Desiccants, Inc. v. Medzam, Ltd.*, 133 F.3d 1473, 1477 (Fed. Cir. 1998), *Innova*, 381 F.3d 1116; *Gemstar-TV Guide Int’l, Inc. v. Int’l Trade Comm’n*, 383 F.3d 1352, 1364 (Fed. Cir. 2004); *Vitronics*, 90 F.3d at 1582-83, *Markman*, 52 F.3d at 979-80.

construed in multiple different ways. Specifically the Examiner sets forth the following asserted interpretations of this claim language on page 3 and 4 in the Advisory Action:

...this [claim] language could be construed to mean that the non-error second dispenser does not dispense any drops at all, except "only where" the identified error first dispenser should have, but did not, dispense drops in the said selected path. In other words, the first and second dispensers of a set can only deposit drops in the same locations. If a first dispenser of a set is found to be in error, a non-error second dispenser of the same set, can only dispense where first dispenser failed to cover, and not in a separate location or pattern.

...this [claim] language could be construed to mean that non-error second dispenser dispenses drops only in those locations on the substrate in the selected path where the identified error first dispenser did not dispense drops in the pattern for said selected path of the first group. The Examiner asserts that this limitation encompasses the dispensing of drops by the non-error second dispenser that avoid any droplets resulting from a "soft nozzle failure" that resulted in a solution break up into multiple smaller drop during firing of the identified error first dispenser.

In response, the Appellants submit that the second interpretation above contradicts other explicit limitations of the claims, and thus is not an "alternative" interpretation as asserted by the Examiner.

Specifically, the dispensing operation of independent claims 1, 6, 25, and 52 all include the following:

1. identifying error-dispensers (either "hard" or "soft" error dispensers);
2. depositing drops from non-error dispensers in the selected pattern; and
3. moving a second, redundant dispenser along the selected path while dispensing drops from a non-error second dispenser only where the identified error first dispenser did not dispense drops in the pattern for the selected path.

As is clearly apparent, identified error-dispensers in the claimed invention are actively excluded from dispensing drops anywhere in the selected pattern (i.e., only non-error dispensers are used for this purpose). Therefore, it does not matter whether an error dispenser is a "hard" or "soft" error dispenser because, regardless of the reason a dispenser is identified as an error dispenser, it is simply not used in the dispensing steps. In other words, the error dispensers do not dispense at all (consistent with the first interpretation of the Examiner above).



In the Advisory Action, the Examiner maintains the rejection in light of the Appellants' response to Final Rejection. The Examiner asserts that inspection of this claim limitation in context of the whole claim still renders this limitation indefinite because "included among these limitations is the language that is itself that subject of the rejection under 35 U.S.C. § 112, second paragraph." However, claim limitations are not to be read in a vacuum but at least in context of the claim itself. The Appellants submit that the Examiner's method of claim interpretation runs contrary to established case law and cannot be sustained (see above).

To summarize, Appellants submit that the "alternative" interpretation of the disputed claim language is inconsistent with explicit limitations of the claims and thus is not a valid "alternative" interpretation. It appears to Appellants that the Examiner is simply ignoring certain claim limitations to maintain this rejection.

In view of the foregoing discussion, the Appellants submit that the claims are clear and definite and respectfully request reversal of this rejection.

II. Claims 1-33 and 49-53 do not fail to comply with the written description requirement under 35 U.S.C. § 112, first paragraph.

Claims 1-33 and 49-53 are rejected under 35 U.S.C. § 112, first paragraph as allegedly failing to comply with the written description requirement. The Appellants respectfully traverse this rejection. The Appellants will argue for the rejected claims in a single group.

In making this rejection, the Examiner asserts, as detailed in the previous section, that the claims now encompass methods in which a non-error second dispenser dispenses drops that avoid any droplets resulting from a "soft nozzle failure" that resulted in a solution break up into multiple smaller drops during firing of the identified error first dispenser. The Examiner asserts that this is not adequately described in the specification as filed.

As discussed in detail in the previous section, the Appellants submit that the asserted "alternative" interpretation of the claims put forth by the Examiner is internally contradictory with other clear and unambiguous elements of the claims.

Specifically, the claims clearly and unambiguously state that the error dispensers are not used at all to dispense drops in the selected pattern: only non-error dispensers do so. Therefore, the Appellants submit that the Examiner's "alternative" interpretation of what the claims encompass is untenable and inconsistent with the case law regarding claim interpretation (see discussion in the previous section).

Therefore, the Appellants submit that when read in light of the claims as a whole, the claim limitation at issue cannot encompass the Examiner's "alternative" interpretation, and thus finds full written description support in the specification. The Appellants thus respectfully request that this rejection be reversed.

III. Claims 1-33 and 52 are not unpatentable under 35 U.S.C. §102(a,e) over Kumar et al. (US 6,283,572).

The Examiner has maintained the rejection of Claims 1-33 and 52 under 35 USC § 102(a,e) as being anticipated by Kumar et al. (US 6,283,572). The Appellants respectfully traverse this rejection. The Appellants will argue for the rejected claims in a single group.

The standard for anticipation under 35 U.S.C. § 102 is one of strict identity. An anticipation rejection requires a showing that each limitation of a claim be found in a single reference, *Atlas Powder Co. v. E.I. DuPont de Nemours & Co.*, 224 U.S.P.Q. 409, 411 (Fed. Cir. 1984). Further, an anticipatory reference must be enabling, see *Akzo N.V. v. United States Int'l Trade Comm'n* 808 F.2d 1471, 1479, 1 U.S.P.Q.2d 1241, 1245 (Fed. Cir. 1986), *cert denied*, 482 U.S. 909 (1987), so as to place one of ordinary skill in possession of the claimed invention. To anticipate a claim, a prior art reference must disclose every feature of the claimed invention, either explicitly or inherently. *Glaxo v. Novopharm, Ltd.* 334 U.S. P.Q.2d 1565 (Fed. Cir. 1995).

The presently claimed invention is drawn to methods for fabricating an array. Independent Claim 1 of the present application includes the limitation that "the non-error second dispenser dispenses drops only where the identified error first

dispenser did not dispense drops in the pattern for the selected path" (step d; independent Claims 6, 25 and 52 include the same limitation). In other words, the redundant non-error dispensers of a set do not deposit drops in any location other than where an error dispenser in the same set does not deposit a drop.

The Applicants submit that that the "non-error" dispensers of Kumar et al. are not employed as is claimed in the subject application. Specifically, the "non-error" dispensers of Kumar et al. deposit drops in locations other than where an identified error dispenser did not deposit a drop, in contrast to the claims of the subject application.

For example, Tables I and II in Kumar explicitly show that "non-error" dispensers are used therein to dispense drops both at locations where identified error dispensers did not and at locations other than where identified error dispensers did not. Table II of Kumar et al., which shows a "modified printmask" (i.e., where an error dispenser is identified), and its description is reproduced below.

TABLE II

<u>MODIFIED PRINTMASK</u>					
Row Number On the Printed	Pass Number in Which the First 12 Columns in the	Nozzle Number Used to Print in Passes 1 Through 4 for the Identified Row			
Media	Row Are Printed	Pass 1	Pass 2	Pass 3	Pass 4
Row 1	123412341234	1	49	97	145
Row 2	232123212321	2	50	98	Not Used
Row 3	341234123412	3	51	99	147
Row 4	412341234123	4	52	100	148
* * *	* * *	* * *	* * *	* * *	* * *
Row 48	* * *	48	96	144	192

Assume that nozzle 146 is determined to be malfunctioning from the pen health measurement system. From column 6 of TABLE I it can be seen that nozzle 146 is used to print row 2 on pass number 4. It can also be seen from columns 3-5 that nozzles 2, 50, and 98 are also used to print row 2, but on passes 1, 2 and 3, respectively. Accordingly, either nozzles 2, 50, or 98 could be used to replace using nozzle 146 on pass 4 by using either nozzles 2, 50, or 98 on passes 1, 2, or 3, respectively. Likewise, the same procedure can be used for any other of the 192 nozzles which are shown to be malfunctioning from the pen health measurement system. Since, there would be three substitute nozzle choices in a four-pass printmode, the likelihood of finding a functional nozzle replacement is almost certain. If possible, it would be best to select a functioning nozzle that is not in an adjacent pass to keep the nozzle firing frequency to a minimum. Using this criteria in this example, nozzle 50 in pass 2 would be used to replace nozzle 146, rather than nozzles 98 or 2 which are in adjacent passes 3 and 1, respectively. Thus, the TABLE I printmask would be changed as shown in TABLE II to eliminate the need for printing with nozzle 146.

The Applicants submit that in Kumar, the "non-error" dispensers dispense drops both at locations where identified error dispensers did not (i.e., where "error" dispenser 146 did not) and at locations other than where identified error dispensers did not. Specifically, Table II shows that dispenser 50 dispenses drops in its "normal locations" (i.e., in columns 1, 5 and 9 during Pass 2: unbolded 2s in Row 2, boxed above for emphasis) as well as where "error" dispenser 146 will not (i.e., in columns 3, 7 and 11 during Pass 2: bolded 2s in Row 2). This is in contrast to the claims of the subject application, where the non-error dispensers dispense drops only at locations where identified error dispensers did not.

In view of the foregoing discussion, Appellants submit that Kumar et al. fails to teach each and every element of the claims and as such cannot anticipate them. Appellants thus respectfully requested reversal of this rejection.

IV. Claims 1-33 and 49-53 are not unpatentable under 35 U.S.C. §103(a) over Kumar et al. (Kumar; US 6,283,572) in view of MacBeath et al. (MacBeath; *Science* 289:1760-1763).

The Examiner has maintained the rejection of Claims 1-33 and 52 under 35 USC § 103(b) as being obvious over Kumar in view of MacBeath. The Appellants respectfully

traverse this rejection. The Appellants will argue for the rejected claims in a single group.

In making this rejection, the Examiner asserts that Kumar teaches all elements of the claims except methods comprising fabricating an array that is a biopolymeric array (as in claims 49-51 and 53). MacBeath is then cited to remedy this deficiency.

As discussed below, the Appellants submit that Kumar alone or in combination with MacBeath cannot render the claims obvious because not all elements are taught or suggested. Furthermore, the proposed modification of Kumar to comport with the rejected claims would render Kumar's method unsatisfactory for its intended purpose.

In order to meet its burden in establishing a rejection under 35 U.S.C. § 103 the Office must first demonstrate that the combined prior art references teach or suggest all the claimed limitations, as to present "[a] finding that the prior art included each element claimed [...] with the only difference between the claimed invention and the prior art being the lack of actual combination."<sup>2</sup>

It is also well established that rejections based on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning to demonstrate that a person of ordinary skill in the art would have been prompted to combine elements in the way a claimed invention does. See, e.g., *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1740 (2007):

"[A] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art."<sup>3</sup>

As noted previously, the Appellants submit that Kumar fails to at least teach the claim limitation that "the non-error second dispenser dispenses drops only where the identified error first dispenser did not dispense drops." Since MacBeath is cited merely for its teaching of biopolymeric arrays, it fails to remedy the deficiency in

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<sup>2</sup> Federal Register vol. 72, No. 195, Oct 10, 2007. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)  
<sup>3</sup> see also *Pharmastem Therapeutics v. Viacell et al.*, 2007 U.S. App. LEXIS 16245 (Fed. Cir. 2007); *Omegaflex, Inc. v. Parker-Hannifin Corp.*, 2007 U.S. App. LEXIS 14308 (Fed. Cir. 2007) *Dystar Textilfarben GmbH v. C.H. Patrick Co.*, 464 F.3d 1356, 1360 (Fed. Cir. 2006) *In re Kahn*, 441 F.3d 977,985 (Fed. Cir. 2006). *Medichem*, 437 F.3d at 1164. *In re Fulton*, 391 F.3d 1195, 1199-1200 (Fed. Cir. 2004)

Kumar.

The Appellants further submit that modifying the teachings of Kumar to comport with this limitation of the claimed invention would render it unsuitable for its intended purpose. For example, referring back to Table II (reproduced above), to require that "non-error" dispenser 50 only dispense drops where error dispenser 146 does not would result in dispenser 50 failing to deposit drops in its normal locations (i.e., in columns 1, 5 and 9 during Pass 2: unbolded 2s in Row 2). Failure to deposit at such normal locations would result in a printed product that is missing deposited drops where drops should be: precisely the opposite result that Kumar is trying to achieve.

It is established law that if a proposed modification renders the teachings of a prior art reference unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification (see *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)).

As such, because the combined teachings of Kumar and MacBeath fail to teach or suggest each and every element of the claimed invention, the Appellants submit that a *prima facie* case of obviousness has not been established. The Appellants thus respectfully request that this rejection be reversed.

**SUMMARY**

- I. Claims 1-33 and 49-53 are not indefinite under 35 U.S.C. §112, second paragraph, for failing to point out and distinctly claim the subject matter Appellants consider the invention. The Appellants contend that the “alternative” interpretation of certain claim language by the Examiner is inconsistent with case law on claim interpretation as well as being internally inconsistent with other clear elements of the claim.
- II. Claims 1-33 and 49-53 comply with the written description requirement of 35 U.S.C. §112, first paragraph. The Appellants submit that written description support can be found in the specification when claims are appropriately interpreted.
- III. Claims 1-33 and 52 are not unpatentable under 35 U.S.C. §102(a,e) over Kumar et al. (US 6,283,572) because Kumar fails to teach a non-error dispenser that dispenses drops only where an identified error dispenser did not dispense drops.
- IV. Claims 1-33 and 49-53 are not unpatentable under 35 U.S.C. §103(a) over Kumar et al. (US 6,283,572) in view of MacBeath et al. (*Science* 289:1760-1763) because MacBeath et al. fail to remedy the deficiency in the teachings of Kumar, i.e., that a non-error dispenser dispenses drops only where an identified error dispenser did not dispense drops. In addition, modifying the teachings of Kumar to read on the claimed invention would render it inoperable for its intended purpose.

**RELIEF REQUESTED**

The Appellants respectfully request that the rejections of claims 1-33 and 49-53 under 35 U.S.C. §112, first and second paragraphs, claims 1-33 and 52 under 35 U.S.C. §102(a,e), and claims 1-33 and 49-53 under 35 U.S.C. §103(a) be reversed, and that the application be remanded to the Examiner with instructions to issue a Notice of Allowance.

Respectfully submitted,

Date: February 12, 2008

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**CLAIMS APPENDIX**

1. A method of fabricating a chemical array using:
  - a head system with multiple groups of drop dispensers;
  - a transport system to move the head system with respect to a substrate;
  - a processor to dispense droplets from dispensers during operation of the transport system in a pattern along a selected path for each group;the method comprising:
  - a) loading the dispensers with fluid such that each dispenser group has at least one set of redundant dispensers loaded with a same fluid;
  - b) dispensing drops from the dispensers to identify an error in one or more dispensers;
  - c) moving a first dispenser of each of the at least one set of redundant dispensers in each group along the selected path for that group while dispensing drops from non-error first dispensers of the sets in at least part of the pattern along the selected path for each group;
  - d) moving a second dispenser of each of the at least one set of redundant dispensers in each group along the selected path for that group while dispensing drops from a non-error second dispenser of a set having an identified error first dispenser in at least part of the pattern for the selected path of that group, wherein the non-error second dispenser dispenses drops only where the identified error first dispenser did not dispense drops in the pattern for the selected path; and
  - e) repeating (a) through (d) at least once;wherein the array is fabricated.
2. A method according to claim 1 wherein in step (d) drops are dispensed from each second dispenser of multiple groups in at least part of the pattern for the selected path of the same group.
3. A method according to claim 2 wherein:
  - dispensers within a set of redundant dispensers communicate with a common reservoir for that set.

4. A method according to claim 1 wherein the dispensers are pulse jets.
5. A method according to claim 2 wherein in (d) the drops are dispensed from at least one second dispenser of a set of redundant dispensers, in the complete pattern for the first dispenser of the same set.
6. A method of fabricating a chemical array using:
  - a head system with multiple groups of dispensers, the members of each group being arranged in multiple series extending in a first direction;
  - a transport system to move the head system with respect to a substrate with different series following respective paths, series from different groups which can simultaneously move along the selected paths for their groups forming a dispenser frame;
  - a processor to dispense drops from dispensers during operation of the transport system, in a pattern along a selected path for each group;the method comprising:
  - a) loading the dispensers with fluid such that each dispenser group has multiple sets of redundant dispensers loaded with a same fluid;
  - b) dispensing drops from the dispensers to identify an error in one or more dispensers;
  - c) moving a first dispenser frame along the selected paths for the groups while dispensing drops from non-error dispensers of the first frame in at least part of the pattern along the selected paths for the groups;
  - d) when an error dispenser is detected in the first frame, moving a further frame along the selected paths for the groups while dispensing drops from a non-error dispenser of the further frame located in the same set as the error dispenser in at least part of the patterns along the selected paths for the groups, wherein the non-error dispenser of the further frame dispenses drops only where the identified error dispenser of the first frame did not dispense drops in the pattern for the selected paths; and
  - e) repeating (a) through (d) at least once;

wherein the array is fabricated.

7. A method according to claim 6 wherein the multiple sets extend in a second direction sideways to the first direction.
8. A method according to claim 7 wherein the selected paths extend in the first direction.
9. A method according to claim 7 wherein the dispensers of the head system move in unison.
10. A method according to claim 7 wherein the first and further dispenser frames are moved in turn along the selected paths.
11. A method according to claim 8 wherein the head is displaced sideways to the selected paths to bring each further frame into alignment with the selected paths.
12. A method according to claim 8 wherein the first frame is selected based on the number of non-error dispensers in the first frame.
13. A method according to claim 8 wherein in (d) when error dispensers are detected in a further frame, then multiple further frames are moved along the selected paths for the groups while dispensing drops from non-error dispensers of each of the further frames in at least part of the patterns along the selected paths for the groups.
14. A method according to claim 13 wherein drops are dispensed from non-error dispensers in the same sets as the error dispensers.
15. A method according to claim 8 wherein in (c) and (d) frames so moved are each selected as a frame among previously non-selected frames which has the highest number of non-error dispensers in sets not containing a non-error dispenser

in a previously selected frame.

16. A method according to claim 15 wherein when more than one frame has the highest number then selecting from among such highest number frames a frame which has a best non-error dispenser in a set not containing a non-error dispenser in a previously selected frame, wherein the best non-error dispenser more closely meets a predetermined criterion than a non-error dispenser of another highest number frame.

17. A method according to claim 15 additionally comprising, when a set contains a non-error dispenser in more than one selected frame, then determining a best dispenser from among those non-error dispensers which more closely meets a predetermined criterion and dispensing drops in at least part of the pattern along the selected path for that group in which that best dispenser is located when the frame containing that best dispenser is moved along the selected path for that group.

18. A method according to claim 16 wherein the predetermined criterion is a drop size.

19. A method according to claim 16 wherein the predetermined criterion is a drop placement.

20. A method according to claim 7 wherein the dispensers are pulse jets.

21. A method according to claim 12 wherein:  
dispensers in each of multiple sets of each of multiple groups, communicate with a corresponding common reservoir for that column.

22. A method according to claim 7 wherein the dispensing of (b) is performed after each loading in (a) and before the moving and dispensing of (c) and (d).

23. A method according to claim 7 wherein the series are arranged in rows.

24. A method according to claim 7 wherein the sets are arranged in columns.

25. A method of fabricating a chemical array using:

a head system with multiple groups of dispensers, the members of each group being arranged in multiple series extending in a first direction and multiple sets extending in a second direction sideways to the first direction;

a transport system to move the head system with respect to a substrate with different series following respective paths, series from different groups which can simultaneously move along the selected paths for their groups forming a dispenser frame;

a processor to dispense drops from dispensers during operation of the transport system, in a pattern along a selected path for each group;  
the method comprising:

- a) loading the dispensers with fluid such that dispensers within each set of the groups are loaded with a same fluid;
- b) dispensing drops from the dispensers to identify an error in one or more dispensers;
- c) moving a first frame along the selected paths for the groups while dispensing drops from non-error dispensers of the first frame in at least part of the pattern along the selected paths for the groups; and
- d) when an error dispenser is detected in the first frame, then multiple selected frames are moved along the selected paths for the groups while dispensing drops from non-error dispensers of each of the frames in at least part of the pattern along the selected paths for the groups, wherein each of the frames so moved is selected as the frame among previously non-selected frames which has the highest number of non-error dispensers in sets not containing a non-error dispenser in a previously selected frame, wherein the non-error dispensers of the multiple selected frames dispense drops only where the identified error dispensers of the first frame did not dispense drops in the pattern for the selected paths;

wherein the array is fabricated.

26. A method according to claim 25 wherein the selected paths extend in the first direction.
27. A method according to claim 25 wherein the dispensers of the head system move in unison.
28. A method according to claim 25 wherein the first and further dispenser frames are moved in turn along the selected paths.
29. A method according to claim 26 wherein the head is displaced sideways to the selected paths to bring each further frame into alignment with the selected paths.
30. A method according to claim 25 wherein the dispensers are pulse jets.
31. A method according to claim 25 wherein:  
dispensers in each of multiple sets of each of multiple groups, communicate with a corresponding common reservoir for that column.
32. A method according to claim 25 wherein the series are arranged in rows.
33. A method according to claim 26 wherein the sets are arranged in columns.
49. A method according to claim 1, wherein the fabricated array is a biopolymeric array.
50. A method according to claim 6, wherein the fabricated array is a biopolymeric array.
51. A method according to claim 25, wherein the fabricated array is a biopolymeric array.

52. A method of fabricating a chemical array using:
- a head system with multiple groups of drop dispensers;
  - a transport system to move the head system with respect to a substrate;
  - a processor to dispense droplets from dispensers during operation of the transport system in a pattern along a selected path for each group;
- the method comprising:
- a) loading the dispensers with fluid such that each dispenser group has at least one set of redundant dispensers loaded with a same fluid;
  - b) dispensing drops from the dispensers to identify an error in one or more dispensers;
  - c) moving a first dispenser of each of the at least one set of redundant dispensers in each group along the selected path for that group while dispensing drops from non-error first dispensers of the sets in at least part of the pattern along the selected path for each group;
  - d) moving a second dispenser of each of the at least one set of redundant dispensers in each group along the selected path for that group while dispensing drops from a non-error second dispenser of a set having an identified error first dispenser in at least part of the pattern for the selected path of that group, wherein the first and the second dispensers of the same set are not moved along the selected path simultaneously and the non-error second dispenser dispenses drops only where the identified error first dispenser did not dispense drops in the pattern for the selected path; and
  - e) repeating (a) through (d) at least once;
- wherein the array is fabricated.
53. A method according to claim 52, wherein the fabricated array is a biopolymeric array.

**EVIDENCE APPENDIX**

No evidence that qualifies under this heading has been submitted during the prosecution of this application, and as such it is left blank.



**RELATED PROCEEDINGS APPENDIX**

As stated in the *Related Appeals and Interferences* section above, there are no other appeals or interferences known to Appellants, the undersigned Appellants' representative, or the assignee to whom the inventors assigned their rights in the instant case, which would directly affect or be directly affected by, or have a bearing on the Board's decision in the instant appeal. As such this section is left blank.